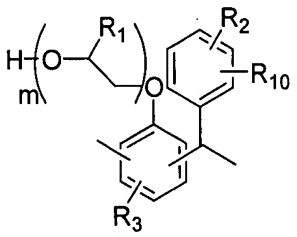
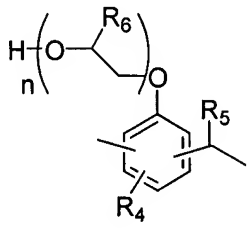
CLAIMS

1. An alkoxylated alkylphenol-arylaldehyde polymer comprising repeating units of formula



I



II

wherein R_1 and R_6 are independently H, methyl or ethyl; R_2 and R_{10} are independently H, C_1-C_{18} alkyl, C_5-C_{10} aryl, hydroxy, alkoxy or halogen; R_3 and R_4 are independently C_1-C_{18} alkyl; R_5 is H, C_1-C_3 alkyl, or arylalkyl or a mixture thereof; and m and n are independently 1 to about 30, wherein the alkoxylated alkylphenol-arylaldehyde polymer comprises 1 to about 40 monomer units of formula I, 0 to about 39 monomer units of formula II and the monomer units of formula I and II are present in a ratio about 1:10 to about 10:1.

2. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 wherein R_2 and R_{10} are H.

3. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 comprising about 3 to about 40 repeating units of formula I wherein the monomer unit of formula II is absent.

4. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 wherein m and n are independently 1 to about 20.

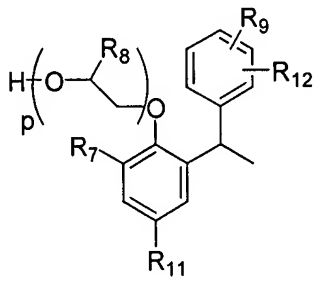
5. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 wherein R_3 and R_4 are independently C_4-C_{12} alkyl.

6. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 wherein R_1 and R_6 are independently H or methyl.

7. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 wherein R_5 is H or methyl or a mixture thereof.

8. The alkoxylated alkylphenol-arylaldehyde polymer of claim 7 wherein R_5 is a mixture of H and methyl in a ratio of about 1:10 to about 10:1.

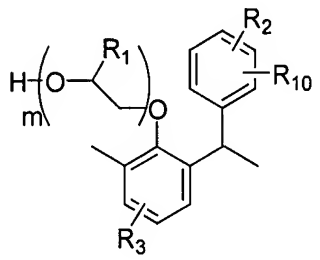
9. The alkoxylated alkylphenol-arylaldehyde polymer of claim 1 further comprising a terminal group of formula III



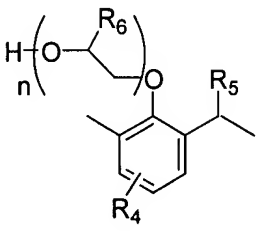
III

wherein R_7 and R_{11} are independently C_1-C_{18} alkyl; R_8 is H, methyl or ethyl; R_9 and R_{12} are independently H, C_1-C_{18} alkyl, C_5-C_{10} aryl, hydroxy, alkoxy or halogen; and p is 1 to about 30.

10. An alkoxylated alkylphenol-arylaldehyde polymer according to claim 1 comprising repeating units of formula VII and VIII



VII



VIII

wherein R_1 and R_6 are independently H, methyl or ethyl; R_2 and R_{10} are independently H, C_1-C_{18} alkyl, C_5-C_{10} aryl, hydroxy, alkoxy or halogen; R_3 and R_4 are independently C_1-C_{18} alkyl; R_5 is H, C_1-C_3 alkyl, or arylalkyl or a mixture thereof; and m and n are independently 1 to about 30, wherein the alkoxylated alkylphenol-arylaldehyde polymer comprises 1 to about 40 monomer units of formula VII, 0 to about 39 monomer units of formula VIII and the monomer units of formula VII and VIII are present in a ratio about 1:10 to about 10:1.

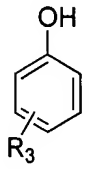
11. The alkoxylated alkylphenol-arylaldehyde polymer of claim 10 comprising about 3 to about 40 repeating units of formula VII wherein the monomer unit of formula VIII is absent.

12. The alkoxylated alkylphenol-arylaldehyde polymer of claim 11 comprising about 3 to about 30 repeating units of formula VII wherein m is 1 to about 20; R_1 is H or methyl; R_2 and R_{10} are H; and R_3 is C_4-C_{12} alkyl.

13. A demulsifier composition for resolving water-in-oil emulsions comprising one or more alkoxylated alkylphenol-arylaldehyde polymers according to claim 1.

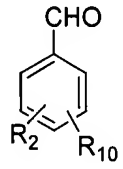
14. A method of preparing the alkoxylated alkylphenol-arylaldehyde polymer of claim 1 comprising:

i) reacting one or more alkylphenols of formula IV



IV

wherein R_3 is H or straight or branched C_1-C_{18} alkyl, with about 0.05 to about 1.2 molar equivalents of a arylaldehyde compound of formula V

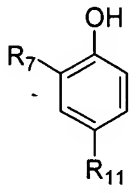


V

wherein R_2 and R_{10} are independently H, straight or branched C_1-C_{18} alkyl, C_5-C_{10} aryl, hydroxy, alkoxy or halogen and optionally about 0.05 to about 0.95 molar equivalents of one or more aliphatic aldehydes of formula R_5CHO wherein R_5 is H, C_1-C_3 alkyl, or arylalkyl to form an alkylphenol-arylaldehyde polymer; and

ii) reacting the alkylphenol-arylaldehyde polymer with about 1 to about 30 molar equivalents of one or more alkylene oxides.

15. The method of claim 14 wherein the alkylphenol comprises a mixture of the alkylphenol of formula IV and a dialkylphenol of formula VI



VI

wherein R_7 and R_{11} are independently C_1-C_{18} alkyl.

16. A method of resolving a water-in-oil emulsion comprising adding to the emulsion an effective demulsifying amount of one or more alkoxylated alkylphenol-arylaldehyde polymers according to claim 1.

17. The method of claim 16 wherein the water-in-oil emulsion is a crude oil emulsion.

18. The method of claim 17 wherein the crude oil emulsion is a refinery desalting emulsion.

19. The method of claim 17 wherein the crude oil emulsion is a crude oil production emulsion.